AMENDMENTS TO THE CLAIMS:

1. (currently amended) A process of preparing unsaturated fatty acids, which comprises introducing, into an organism, at least one isolated nucleic acid sequence encoding a polypeptide having Δ6-desaturase activity, selected from the group consisting of:
   a) A nucleic acid sequence having the sequence shown in SEQ ID NO: 1,
   b) nucleic acid sequences which, as a result of the degeneracy of the genetic code, are derived from the sequence shown in SEQ ID NO: 1,
   c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 and have at least ~~85~~ 95% homology at the amino acid level without substantially reducing the enzymatic action of the polypeptides,

   and culturing ~~this~~ the organism, where the cultured organism contains at least 1 mol% of unsaturated fatty acids based on the total fatty acid content in the organism.

2. (currently amended) The process as claimed in claim 1, wherein the isolated nucleic acid sequence is derived from a plant or algae.

3. (currently amended) The process a claimed in claim 1, wherein the isolated nucleic acid sequence is derived form Physcomitrella patens.

4. (previously presented) The process as claimed in claim 1, wherein the organism is an organism selected from the group consisting of bacterium, fungus, ciliate, algae, cyanobacterium, animal or and plant.

5. (previously presented) The process as claimed in claim 1, wherein the organism is a plant or algae.

6. (previously presented) The process as claimed in claim 1, wherein the organism is an oil crop.

7. (previously presented) The process as claimed in claim 1, wherein the cultured organism contains at least 5% by weight of unsaturated fatty acids based on the total fatty acid content in the organism.

8. (previously presented) The process as claimed in claim 1, wherein the unsaturated fatty acids are isolated from the organism.

9. (currently amended) A transgenic organism selected from the group consisting of plants, fungi, ciliates, algae, bacteria, and cyanobacteria ~~and animals~~ comprising at least one isolated nucleic acid sequence encoding a polypeptide with Δ6-desaturase activity, selected from the group consisting of:

a) A nucleic acid sequence having the sequence shown in SEQ ID NO: 1,

b) nucleic acid sequences which, as a result of the degeneracy of the genetic code, are derived from the sequence shown in SEQ ID NO: 1,

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 and have at least ~~85~~ 95% homology at the amino acid level without substantially reducing the Δ6-desaturase action of the polypeptides,

10. (previously presented) A transgenic organism as claimed in claim 9, wherein the organism is a plant or algae.

11. (withdrawn) An oil, lipid or fatty acid or fraction thereof, prepared by the process as claimed in claim 1.

12. (withdrawn) The use of the oil, lipid or fatty acid composition as claimed in claim 11 or of a transgenic organism in feed, foodstuffs, cosmetics or pharmaceuticals.

13. (new) A process of preparing unsaturated fatty acids, which comprises introducing, into an organism, at least one isolated nucleic acid sequence encoding a polypeptide having Δ6-desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence having the sequence shown in SEQ ID NO: 1,

b) nucleic acid sequences which, as a result of the degeneracy of the genetic code, are derived from the sequence shown in SEQ ID NO: 1,

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequences shown in SEQ ID NO: 2 or polypeptides with amino acid sequences having at least 95% homology at the amino acid level and at least 20% of the Δ6-desaturase activity of the polypeptides with the amino acid sequences shown in SEQ ID NO: 2,

and culturing the organism, where the cultured organism contains at least 1 mol% of unsaturated fatty acids based on the total fatty acid content in the organism.